

REMARKS

Claims 26, 28-30, 32, 34, 36, 37, 39 and 41-43 are pending in the application. Claims 26, 28-30, 32, 34, 36, 37, 39 and 41-43 are rejected. No claims are allowed. No claims have been amended. No new claims been added. Upon entry of this response, claims 26, 28-30, 32, 34, 36, 37, 39, and 41-43 will be presented for examination.

Reconsideration of the rejections and allowance of claims 26, 28-30, 32, 34, 36, 37, 39, and 41-43 in view of the following remarks are respectfully requested. As will be discussed below, these claims provide for a method of treating plants with an agrochemical, comprising spraying the plants with the agrochemical in combination with a micro-emulsion composition consisting of an oil phase, a hydrophilic emulsifier selected from alkyl(oligo)glycosides, a lipophilic co-emulsifier selected from the group consisting of glycerol esters of C6-C22 fatty acids, and sorbitan esters of C6-C22 fatty acids, and water. The agrochemical is a water-soluble or substantially soluble agrochemical. As compared to solvent-based agrochemical compositions, the claimed water-based micro-emulsion exhibits improved biodegradability, reduced foaming behavior, and higher cloud point that allows an improved stability and shelf life at higher temperatures. The cited references do not contemplate such an agrochemical.

Claim Rejections – 35 U.S.C. § 103

Claims 26, 28-30, 32, 34, 36, 37, 39, and 41 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Auda et al. (U.S. 6,586,366). This basis of rejection is respectfully traversed.

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), viz., (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; and (3) the level of ordinary skill in the art. “[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability.” *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). To establish a *prima facie* case of obviousness, all the claim limitations must be taught or

suggested by the prior art. *See In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Furthermore, although the analysis need not identify explicit teachings directed to the claimed subject matter, “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 82 USPQ2d 1385, 1396 (2007). As such, “there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.* (quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006)).

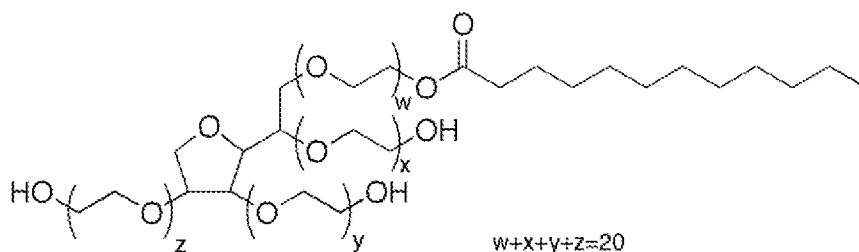
Claim 26

Claim 26 is directed toward method of treating plants with an agrochemical, comprising spraying the plants with the agrochemical in combination with an oil-in-water micro-emulsion composition consisting of from about 5% to about 50% of an oil phase, from about 2% to about 20% of a hydrophilic emulsifier selected from the group consisting of alkyl(oligo)glycosides, from about 2% to about 15% of a lipophilic co-emulsifier selected from the group consisting of glycerol esters of C6-C22 fatty acids, and sorbitan esters of C6-C22 fatty acids, and from about 10% to about 90% water. The ratio by weight of hydrophilic emulsifier to the combined weight of hydrophilic emulsifier and lipophilic co-emulsifier is from about 0.60 to about 0.80. Additionally, the agrochemical is a water-soluble or substantially water-soluble agrochemical, and the micro-emulsion composition increase the field efficacy of the agrochemical over a similar method without the micro-emulsion composition.

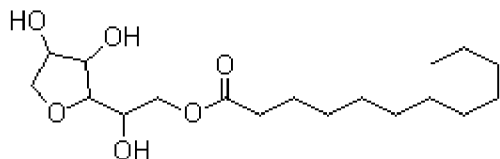
Auda relates to surfactant compositions that contain a plurality of surfactants and at least one oil, and which is readily emulsifiable into water. (Auda at column 1, lines 5-8). Specifically, Auda discloses oil-based concentrates that include at least one oil component, at least one surfactant hydrocarboxyl saccharide, particularly a surfactant hydrocarbyl polysaccharide (HPS), and at least one other non-ionic surfactant. (*Id.* at column 1, lines 10-15). The Office Action states that Auda teaches an agrochemical formulation comprising at least one oil component, at least one hydrophilic emulsifier, and at least one other nonionic surfactant that is a lipophilic emulsifier. (Office Action at page 2). Applicants respectfully submit that the Office Action is mistaken in its assertion that the nonionic surfactant, polyethoxylated sorbitan

monolaurate, of Auda is a lipophilic emulsifier, and that it is equivalent to the lipophilic unethoxylated sorbitan monolaurate claimed by the Applicants. As will be explained in detail below, there is no technical basis in this statement by the Examiner. To the extent the Examiner asserts otherwise, it is respectfully requested that the Examiner provide an affidavit or declaration pursuant to MPEP 2144.03 on this point.

As recognized by one skilled in the art, polyethoxylated sorbitan monolaurate and unethoxylated sorbitan monolaurate are distinct in their physicochemical properties because one is hydrophilic in nature, while the other is lipophilic. By way of illustration of its hydrophilic nature due to the presence of repeating hydrophilic polar head groups (ethoxy groups) in the backbone, the chemical structure of polyethoxylated sorbitan monolaurate (e.g. Polysorbate 20) is:



In contrast, the chemical structure of unethoxylated sorbitan monolaurate with no hydrophilic polar head groups in the backbone, thereby depicting its lipophilic nature is:

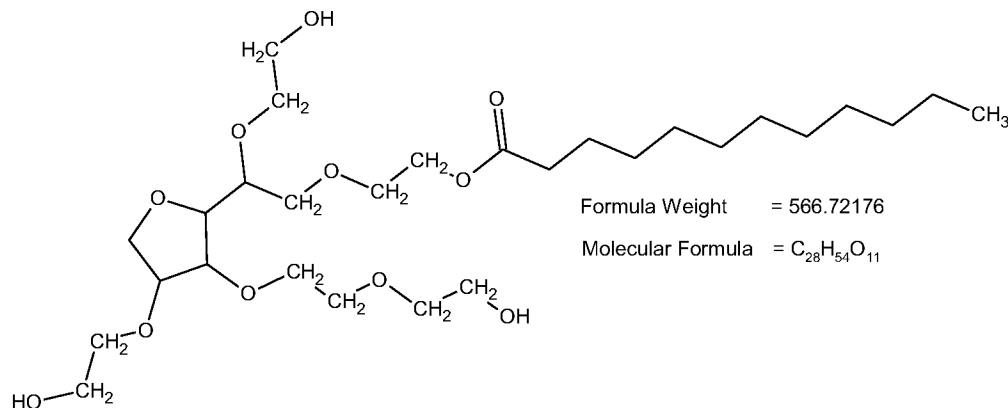


With more specificity, and as recognized by one skilled in the art, there exists a semi-empirical scale for selecting surfactants (*see* Exhibit A pp. 25-27, which is an excerpt from the textbook *Emulsion Science and Technology*). This scale is known as the hydrophilic-lipophilic balance (HLB) number, and is based on the relative percentage of hydrophilic to lipophilic (i.e. hydrophobic) groups in the surfactant molecules. The higher the HLB number, the more hydrophilic the surfactant. An HLB of 0 corresponds to a completely lipophilic (i.e. hydrophobic) molecule, and an HLB value of 20 corresponds to a molecule made up completely of hydrophilic components. A molecule with an HLB value less than 10 is considered lipophilic

or hydrophobic, while a molecule with an HLB value greater than 10 is considered hydrophilic. It is well recognized by one skilled in the art that for an alcohol ethoxylate, such as polyethoxylated sorbitan monolaurate, the HLB number can be calculated from the weight percent of ethylene oxide (E) (i.e. the number of ethylene oxide units) and the weight percent of polyhydric alcohol (P):

$$\text{HLB} = (\text{E} + \text{P}) / 5$$

As used in Auda, the pentaethoxylated sorbitan monolaurate (i.e. polyoxyethylene (5 EO) sorbitan monolaurate) is sorbitan laurate plus 5 ethylene oxide units (see Auda at column 7, line 15). This polyethoxylated sorbitan monolaurate depicted here:



has a molecular weight of about 566 g/mol. The polyhydric alcohol part of this pentaethoxylated sorbitan monolaurate has a molecular weight of 346 g/mol, which gives a 61 wt-% [(346/566) x 100 = 61%] share for the % polyhydric alcohol. Thus, using the above known equation, the HLB for the pentaethoxylated sorbitan monolaurate of Auda is calculated as:

$$\text{HLB} = (5 + 61)/5 = 13.2$$

According to another source available here at Table 2, page 42:

<http://www.scribd.com/doc/57878184/9/A-Hydrophile-Lipophile-Balance-HLB>, the HLB value of polyethoxethylene (5 EO) sorbitan monolaurate value is shown to be 13.3, which is consistent with the calculated value. A surfactant, such as pentaethoxylated sorbitan monolaurate, with an HLB of 13.3 is hydrophilic. Other known alcohol ethoxylates are also highly hydrophilic, e.g. Polysorbate 20 (HLB = 16.7), Polysorbate 40 (HLB = 15.6), Polysorbate 60 (HLB = 14.9), and Polysorbate 80 (HLB = 15.0). It should be noted that the HLB values for these known alcohol

ethoxylates are readily available from various public sources (Exhibit A at p. 27) (*see also* <http://pharmcal.tripod.com/ch17.htm>).

As to the unethoxylated sorbitan monolaurate, the HLB value is more difficult to calculate because there are essentially no hydrophilic components to the molecule. Fortunately, the HLB value of 8.6 for sorbitan monolaurate, having 0 EO units is also well known to one skilled in the art, and is readily available by a Google® search (<http://chemicaland21.com/specialtychem/perchem/POLYOXYETHYLENE%20SORBITAN%20LAURATE.htm>). Thus, it is clear that sorbitan monolaurate, with an HLB value less than 10, is lipophilic, while polyethoxylated sorbitan monolaurates, such as the pentaethoxylated sorbitan monolaurate of Auda, with HLB values greater than 10, are hydrophilic.

Moreover, the hydrophilic nature of ethoxylated agents in sharp contrast to unethoxylated agents is detailed by the *Emulsion Science and Technology* textbook where it details emulsifying agents at opposite ends of the HLB scale: Tween® 80 (sorbitan mono-oleate with 20 moles EO, HLB = 15) and Span® 80 (sorbitan mono-oleate, HLB = 5) (Exhibit A at p. 27).

Therefore, Applicants respectfully submit that Auda's combination of a hydrocarbyl polysaccharide, which, as recognized by the Office Action, is hydrophilic, and at least one other non-ionic surfactant that is polyethoxylated sorbitan monolaurate, is a combination of two hydrophilic surfactants, and not the balanced combination of hydrophilic emulsifiers and lipophilic co-emulsifiers claimed by the Applicants. Therefore, the Applicants' claimed micro-emulsion composition is distinct from that of Auda. Applicants respectfully submit that claim 26 is not obvious over Auda. Withdrawal of this basis of rejection is respectfully requested.

Furthermore, the Office Action states that the "instant specification does not exclude the use of polyethoxylated sorbitan monolaurates specifically, but the specification rather excludes broadly alkoxyated nonionic surfactants due to poor biodegradability and phytotoxicity to plants." (Office Action at page 4). Applicants respectfully submit that the Office Action has misinterpreted the teachings of the specification and the claims and disregarded the claim term "consisting of." The specification states that emulsifiers of the prior art "commonly comprises alkoxyated non-ionic surfactants, e.g., ethylene oxide, propylene oxide, and mixtures thereof,...However, these microemulsions contain a large amount of surfactants based on ethylene and propylene oxide block copolymers, which are poorly biodegradable and phytotoxic

to plants.” (Specification at page 1, lines 25-26 to page 2, lines 11-14). Applicants submit that this teaching in the specification specifically points out that alkoxyated non-ionic surfactants, including surfactants that are based on ethylene and propylene oxide block copolymers (i.e. polyethoxylated sorbitan monolaurates) are contraindicated as emulsifiers in the agrochemical formulations of the present invention due to their lack of biodegradability, their phytotoxicity, and their micro-emulsion stability issues. Thus, if anything, the composition of Auda, which contains a hydrophilic alkoxyated non-ionic surfactant (i.e., polyethoxylated sorbitan monolaurate), teaches away from the present claims.

Moreover, independent claims 26 and 42 subpart (c) contain the transitional phrase “consisting of.” Transitional phrases in claims are important and cannot be ignored, as they specify whether the claim is limited to only the elements listed, or whether the claim may cover items or processes that have additional elements. The transitional phrase “consisting of” is considered to be a closed-ended phrase because it means the composition (or device or method) has the recited elements (or steps) and no more. As established in MPEP § 2111.03:

The transitional phrase "consisting of" excludes any element, step, or ingredient not specified in the claim. *In re Gray*, 53 F.2d 520, 11 USPQ 255 (CCPA 1931); *Ex parte Davis*, 80 USPQ 448, 450 (Bd. App. 1948) ("consisting of" defined as "closing the claim to the inclusion of materials other than those recited except for impurities ordinarily associated therewith."). But see *Norian Corp. v. Stryker Corp.*, 363 F.3d 1321, 1331-32, 70 USPQ2d 1508, 1516 (Fed. Cir. 2004) (holding that a bone repair kit "consisting of" claimed chemicals was infringed by a bone repair kit including a spatula in addition to the claimed chemicals because the presence of the spatula was unrelated to the claimed invention). A claim which depends from a claim which "consists of" the recited elements or steps cannot add an element or step. **When the phrase "consists of" appears in a clause of the body of a claim, rather than immediately following the preamble, it limits only the element set forth in that clause;** other elements are not excluded from the claim as a whole. *Mannesmann Demag Corp. v. Engineered Metal Products Co.*, 793 F.2d 1279, 230 USPQ 45 (Fed. Cir. 1986).

(see MPEP 2111.03, emphasis added). Thus, subpart (c) in independent claims 26 and 42, which recites “from about 2% to about 15% of a lipophilic co-emulsifier selected from the group **consisting of** glycerol esters of C6-C22 fatty acids, and sorbitan esters of C6-C22 fatty acids”

excludes any ingredient not specified in the claim. In other words, the lipophilic co-emulsifier can only be a glycerol ester of C6-C22 fatty acids or a sorbitan ester of C6-C22 fatty acids. As recognized by one skilled in the art of chemistry, sorbitan esters of C6-C22 fatty acids do not include polyethoxylated sorbitan monolaurates; polyethoxylated sorbitan monolaurates are ethoxylated sorbitan esters, which are distinct chemical entities from sorbitan esters of C6-C22 fatty acids. Because Auda teaches away from unethoxylated sorbitan monolaurate and because the claim language uses the phrase “consisting of,” Applicants respectfully submit that the specification and claims exclude polyethoxylated sorbitan monolaurate. Thus, in view of the arguments above, it is clear that Applicant’s claimed micro-emulsion is chemically unique when compared to the composition of Auda, and that Auda fails to teach all the limitations of Applicants’ claimed invention.

Accordingly, Applicants respectfully submit that because Auda fails to teach or suggest all the limitations of claim 26, namely the balanced combination of hydrophilic emulsifiers and lipophilic co-emulsifiers, the Office Action has not established a factual basis to support a legal conclusion of obvious. Thus, Applicants submit that the Office Action has not established *prima facie* obviousness, and claim 26 is patentable over Auda. Withdrawal of this rejection is respectfully requested.

For the same reasons that claim 26 is patentable, claims 28-30, 32, 34, 36, 37, 39, and 41 are also patentable. Withdrawal of the rejection of these claims is also respectfully requested.

Claim 42

Claims 42 and 43 have been rejected under 35 U.S.C. § 103 (a) as allegedly being unpatentable over Auda as applied to claims 26, 28-30, 32-34, 36, 37, 39-41 above, and further in view of SU 450563, CN 1052302 (Tang) or JP 04046104 (Okada). Applicants respectfully traverse this basis of rejection.

Claim 42 is directed toward a method for treating plants with an agrochemical, comprising spraying the plants with the agrochemical in combination with an oil-in-water micro-emulsion composition consisting of from about 5% to about 50% of an oil phase, from about 2% to about 20% of a hydrophilic emulsifier selected from the group consisting of alkyl(oligo)glycosides, from about 2% to about 15% of a lipophilic co-emulsifier selected from

the group consisting of glycerol esters of C6-C22 fatty acids, and sorbitan esters of C6-C22 fatty acids, from about 10% to about 90% water, and one or more auxiliaries selected from the group consisting of clarifying agents, wetting agents, antifreeze agents, antifoam agents, dyes, preservatives, thickening agents, nonionic emulsifiers, cationic emulsifiers, water-soluble alcohols containing from 1 to 6 carbon atoms, inorganic salts, inorganic acids, organic acids and combinations thereof. The ratio by weight of hydrophilic emulsifier to the combined weight of hydrophilic emulsifier and lipophilic co-emulsifier is from about 0.60 to about 0.80. The agrochemical of the present invention is a water-soluble or substantially water-soluble agrochemical. Additionally, the micro-emulsion composition increases the field efficacy of the agrochemical over a similar method without the agrochemical micro-emulsion composition.

As discussed previously, Auda teaches oil-based emulsifiable concentrates and agrochemical formulations resulting therefrom, comprising at least one oil component, at least one hydrophilic surfactant hydrocarbyl saccharide, and at least one other hydrophilic nonionic polyalkoxylated surfactant. Auda does not teach the claimed limitation of a combination of hydrophilic emulsifier with a lipophilic co-emulsifier. Additionally, as admitted by the Office Action, Auda is devoid of any teaching or suggestion that the composition comprise a citric acid and inorganic salt or organic acid. (Office Action at page 5). The Office Action relies on SU 450563, Tang or Okada as teaching the combination of citric acid along with sodium sulphate (inorganic salt), titanium salt (inorganic salt), and organic acid to promote plant growth. SU 450563, CN 1052302 (Tang) or JP 04046104 (Okada), however, are devoid of any teaching or suggestion that a hydrophilic emulsifier selected from the group consisting of alkyl(oligo)glycosides should be combined with a lipophilic co-emulsifier selected from the group consisting of glycerol esters of C6-C22 fatty acids, and sorbitan esters of C6-C22 fatty acids. Thus, SU 450563, CN 1052302 (Tang) or JP 04046104 (Okada) fail to remedy the deficiencies of Auda. Even if such a combination were to be justified, which is not conceded here, there would be no expectation of success for arriving at the claimed invention without the presence in Auda of a hydrophilic emulsifier selected from the group consisting of alky(oligo)glycosides and a lipophilic co-emulsifier selected from the group consisting of glycerol esters of C6-C22 fatty acids, and sorbitan esters of C6-C22 fatty acids. Therefore,

Applicants respectfully submit that the claimed invention is not obvious over Auda in view of SU 450563, CN 1052302 (Tang) or JP 04046104 (Okada).

Moreover, SU 450563, CN 1052302 (Tang) or JP 04046104 (Okada) disclose enhancement of plant growth in the presence of citric acid, not the herbicidal effect claimed by the Applicants. The Office Action avers that herbicides are used to enhance plant growth of desired plants by destroying the growth of undesirable plants. (Office Action at page 5). Applicants respectfully submit that the Office Action is confusing the issue. As well recognized by the consuming public, an herbicide, which is commonly known as a weed-killer, is a type of pesticide used to kill/eliminate unwanted plants, particularly weeds. Generally, herbicides work by selectively killing the unwanted weeds, while leaving the desired plant relatively unharmed. The plant growth accelerators described by SU 450563, Tang, and Okada, promote the growth of wanted plants. The herbicidal effects of the claimed invention and the plant growth enhancing effects of the secondary references, therefore, are opposite and mutually exclusive effects. Due to the disparate purposes of these secondary references in view of Auda, Applicants respectfully submit that the Office Action's reasoning lacks a rational basis for the proposed combination of references. Thus, the Office Action is relying upon impermissible hindsight to make such a combination.

The Office Action has not established *prima facie* obviousness, and Applicants' invention is patentable over Auda in view of SU 450563, CN 1052302 (Tang) or JP 04046104 (Okada). Accordingly, any suggestion that the prior art disclose, teach, or suggest the claimed invention would constitute improper picking, choosing, and combining various disclosures that are not directly related to each other by the teachings of the cited references. One would have to pick and choose among a number of broad variables to possibly arrive at Applicants' invention. *See In re Fine*, 837 F.2d 1071, 1075 (Fed. Cir. 1988) ("One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to depreciate the claimed invention."). Indeed, picking and choosing would most definitely lead to combinations that would not result in the claimed invention.

The Federal Circuit has explicitly cautioned against the type of reasoning undertaken by the Examiner in this case. For example, the court in *Ruiz v. A.B. Chance Co.* stated:

The “as a whole” instruction in title 35 prevents evaluation of the invention part by part. Without this important requirement, an obviousness assessment might break an invention into its component parts (A + B + C), then find a prior art reference containing A, another containing B, and another containing C, and on that basis alone declare the invention obvious. This form of hindsight reasoning, using the invention as a roadmap to find its prior art components, would discount the value of combining various existing features or principles in a new way to achieve a new result - often the very definition of invention. Section 103 precludes this hindsight discounting of the value of new combinations by requiring assessment of the invention as a whole. This court has provided further assurance of an “as a whole” assessment of the invention under § 103 by requiring a showing that an artisan of ordinary skill in the art at the time of invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would select the various elements from the prior art and combine them in the claimed manner.

357 F.3d 1270, 1275 (Fed. Cir. 2004).

In the instant case, and as cautioned against by *Ruiz*, the Office Action has used Applicants' disclosure as a roadmap to identify unrelated elements in the cited references to arrive at the claimed invention, when none of the references even remotely suggest a method of treating plants with an agrochemical, comprising spraying the plants with the agrochemical in combination with an oil-in-water micro-emulsion composition consisting of from about 5% to about 50% of an oil phase, from about 2% to about 20% of a hydrophilic emulsifier selected from the group consisting of alkyl(oligo)glycosides, from about 2% to about 15% of a lipophilic co-emulsifier selected from the group consisting of glycerol esters of C6-C22 fatty acids, and sorbitan esters of C6-C22 fatty acids, and from about 10% to about 90% water, wherein the ratio by weight of hydrophilic emulsifier to the combined weight of hydrophilic emulsifier and lipophilic co-emulsifier is from about 0.60 to about 0.80, wherein, the agrochemical is a water-soluble or substantially water-soluble agrochemical, and wherein the micro-emulsion composition increase the field efficacy of the agrochemical over a similar method without the micro-emulsion composition. This is the epitome of “impermissible hindsight,” and cannot support a *prima facie* case of obviousness. See *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1443 (Fed. Cir. 1983) (“To imbue one of ordinary skill in the art with knowledge

of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.”).

Accordingly, Applicants respectfully submit that claim 42 is patentable over Auda in view of SU 450563, CN 1052302 (Tang) or JP 04046104 (Okada). Withdrawal of this basis of rejection is respectfully requested.

For the same reasons that claim 42 is patentable, claim 43 is also patentable. Withdrawal of the rejection of this claim is also respectfully requested.

CONCLUSION

It is believed that claims 26, 28-30, 32, 34, 36, 37, 39, and 41-43 are now in condition for allowance, early notice of which would be appreciated. It is believed that no fees are due with this submission. If any additional fees are due at this time, the Commissioner is authorized to charge Deposit Account No. 50-3329. Please contact the undersigned if any further issues remain to be addressed in connection with this submission.

Respectfully submitted,

Dated: August 19, 2011

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